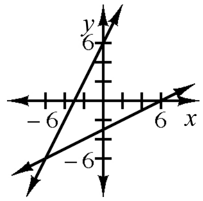
Lesson 6.1.1

6-7. **graph:**



a: $y = 2(x+3)$, b: yes, $y = x$

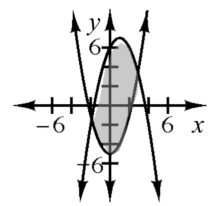
6-8. **a: 9, b: 4, c: $x \approx 1.89$**

6-9. **$x = \sin^{-1}(0.75) \approx 48.59°$; to check: $\sin(48.59°) \approx 0.75$**

6-10. **x must equal y.**

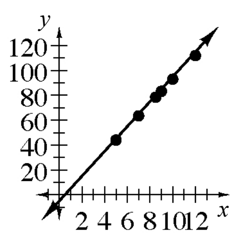
6-11. **a: $x = \frac{12}{5}$, b: $x = \frac{5}{2}$, c: $x = 8$, d: $x = \frac{80}{3}$**

6-12. **The area between an upward parabola with vertex $(0,-5)$ and the downward parabola with vertex $(1,7)$. See graph at right.**



6-13. **a: $\frac{1}{10}$, b: 10^{x+m}**

6-14. **a and b:**

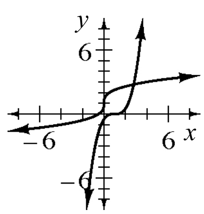


c: possible equation: $y = 10x - 5$
d: for this equation, approximately $495

6-15. **≈ 17.74 feet**

Lesson 6.1.2

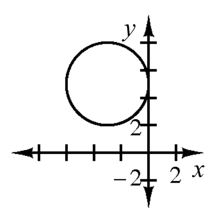
6-26.



6-27. **(–3, 0, 5)**

6-28. **$x \approx 0.53$**

6-29. **$(x+3)^2 + (y-5)^2 = 9$. See graph at right.**



6-30. **a: $\frac{x-3}{x(x-4)}$, b: $\frac{4}{x-2}$, c: 2, d: $\frac{x-1}{x+1}$**

6-31. a: $f(x) \approx 1.5(1.048)^x$, b: ~\$425.04

6-32. 70

6-33. a: $L(x) = x^2 - 1$, $R(x) = 3(x + 2)$; b: 30; c: Order does matter; show by substituting numbers; output is 224 if $x = 3$ for $L(R(x))$.

6-34. a: The system has no unique solution.
b: The graphs do not intersect; they are parallel lines.

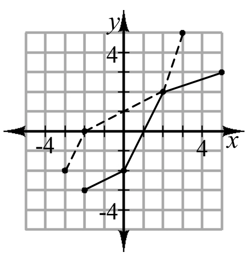
6-35. If she adds nothing else to the account and it just sits there making interest, she will have \$440.13 on her eighteenth birthday.

6-36. a: undefined, b: $x \neq 7$, c: $g(3) = 11$, d: $f(g(3)) = -\frac{1}{2}$

6-37. $x = 2.5$

Lesson 6.1.3

6-44. Trejo is correct; justifications vary.

6-45. 

$f(x)$: domain: $-2 \leq x \leq 5$, range: $-3 \leq y \leq 3$
$f^{-1}(x)$: domain: $-3 \leq x \leq 3$, range: $-2 \leq y \leq 5$

6-46. 121

6-47. 17

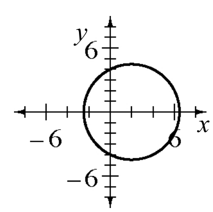
6-48. a: $x^{1/5}$, b: x^{-3}, c: $x^{2/3}$, d: $x^{-1/2}$

6-49. a: $-\frac{10}{7}$; b: $\frac{1}{3}$, 1; c: 115; d: 0, 4

6-50. Rebecca is correct. All the *x* and *y* parts are interchanged. The inverse of the graph on the right has an asymptote at the *x*-axis, domain of $x > 0$, and range of all real numbers.

6-51. $x \approx 19.0$, triangle inequality.

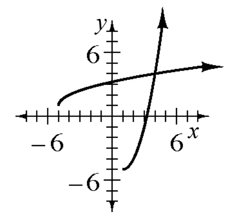
6-52. $(x-2)^2 + y^2 = 20$; circle with center (2, 0) and radius ≈ 4.5; graph shown at right



6-53. a: 3, b: $y - 4$, c: $\frac{1}{3x}$, d: $\frac{x}{x-2}$

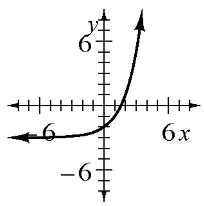
Lesson 6.2.1

6-59. **domain: $x > 0$, range: $-\infty < y < \infty$, x-intercept: $(1, 0)$, no y-intercept, asymptote at $x = 0$**



6-60. **a: $e(x) = (x-1)^2 - 5$**
b: One machine undoes the other, so $e(f(-4)) = -4$.
c: They would be reflections of each other across the line $y = x$.
d: See graph at right.

6-61. **graph:**



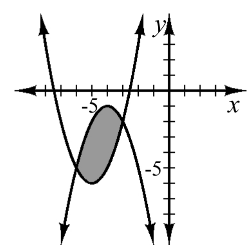
a: domain: $x =$ all real numbers, range: $y > -3$
b: no
c: (0,–2), (1.585,0)
d: sample: $y + a = 2^x$, where $a \le 0$

6-62. **a: $x \approx 36.78$, b: $x \approx 31.43$**

6-63. **$\frac{1}{2}$ no matter where X is placed.**

6-64. **a: $B = 0.07(0.3x)$ or $B = 0.021x$, b: $S = 0.09(0.7)x$ or $S = 0.063x$, c: $0.084x = 5000$; \$59,523.81**

6-65. **a: $\frac{6x-21}{(x-4)(x+1)}$, b: $\frac{5+6x}{2(x-5)}$, c: $\frac{1}{x+1}$, d: $\frac{5}{x^2-9}$**



6-66. **The region between the two parabolas. See graph at right.**

Lesson 6.2.2

6-72. **Rewritten equation: $x = 2^y$. No, they do not look the same. Yes, they mean the same. Yes, they are equivalent. They have the same graph or give the same table of (x, y) values, or one is just a rewritten equation of the other.**

6-73. **a: $x = \log_5(y)$, b: $x = 7^y$, c: $x = \log_8(y)$, d: $K = \log_A(C)$, e: $C = A^K$, f: $K = (\frac{1}{2})^N$**

6-74. **$y = \log_7 x$**

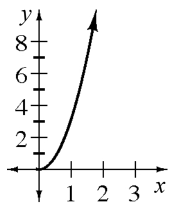
6-75. **$x \approx 1.585$**

6-76. Possible answers: a: Factor and use the Zero Product Property (rewrite), b: Take the square root (undo), c: Quadratic Formula, d: Complete the square (rewrite).

6-77. $x = -4$

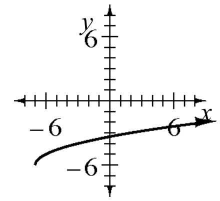
6-78. a: $x = 17\sqrt{3} \approx 29.44$, b: $x = 4\sqrt{2} \approx 5.66$

6-79. graph:



domain: $x \geq 0$
range: $y \geq 0$
x- and y-intercept: (0, 0)
no asymptotes
half of parabola: $y = \pi x^2$

6-80. a: A good sketch would be a parabola opening upwards with a locator point at $(-6, -7)$.
b: Shift the graph up 9 units.
c: The graph is the same except the region below the x-axis is reflected across the axis so that the graph is entirely above the x-axis.
d: See graph at right.
e: $y = \sqrt{x+7} - 6$



Lesson 6.2.3

6-84. possible answer: $y = 2^x + 15$

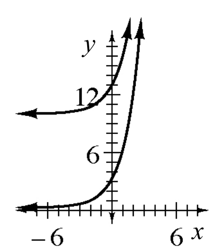
6-85. $\frac{13}{19}$

6-86. $n \approx 3.66$

6-87. $(x+2)^2 + (y-3)^2 = 4r^2$

6-88. $0.66

6-89. See graph at right. a: The second is just the first shifted up ten units; b: $y = km^x + b$.



6-90. a: 10, –8; b: 2, –4; c: $-2 < x < 4$; d: $x \geq 3$ or $x \leq -13$

6-91. a: 2, b: $\frac{1}{x+2}$, c: $\frac{x-4}{(x-2)(x-1)}$, d: $\frac{4x+16}{x(x+2)}$

6-92. b: One possible sequence would yield: Multiplicative Identity, Distributive Property, Distributive Property, Associative Property of Addition, Distributive Property.

Lesson 6.2.4

6-96. **a: 12 because $12^{.926628408} = 10$**
b: Answers vary, but 12 fingers makes sense for base 12.

6-97. **a: 25, b: 2, c: 343, d: $\sqrt{3}$, e: 3, f: 4**

6-98. **It is less than one. Possible justifications: $0.1 < 0.3 < 1$, $\log(0.1) = -1$, and $\log 1$ is 0; or because you would need to raise 10 to a fractional power to get a number less than 10.**

6-99. **$x \approx 17.673$**

6-100. **a: $\frac{4(x+3)}{x-4}$, b: $\frac{1}{4x}$**

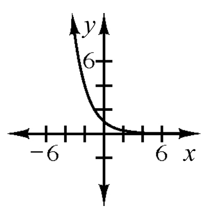
6-101. **a: $-1 < x < 3$, b: $x \leq 1$ or $x \geq 2$**

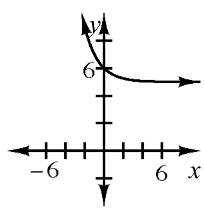
6-102. **$m \approx 2.19$**

6-103. **No; $\log_3 2 < 1$ and $\log_2 3 > 1$.**

6-104. **a: $a = \frac{y}{b^x}$; b: b is the x^{th} root of $\frac{y}{a}$, or $b = \sqrt[x]{\frac{y}{a}}$.**

6-105.





Lesson 6.2.5

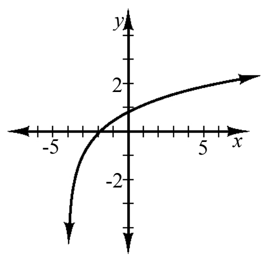
6-113. $f(g(x)) = g(f(x)) = x$ **; They are inverses.**

6-114. No. For $f(x) = mx + b$, $f(a) + f(b) = ma + b + mb + b = m(a+b) + 2b$ **and** $f(a+b) = m(a+b) + b$.

6-115. a: $t(n)$ **is arithmetic,** $h(n)$ **is geometric, and** $q(n)$ **is neither.**
b: No, because $h(n)$ **is increasing much faster than the other two.**
c: $h(1) = q(1) = 12$ **and** $t(2) = h(2) = 36$ **; Continuous graphs for** $t(n)$ **and** $q(n)$ **would intersect again but not for** n **an integer.** $h(n)$ **is increasing much faster than** $q(n)$.

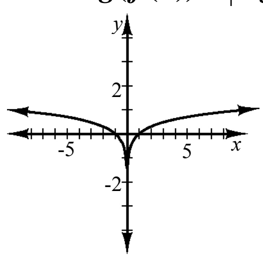
6-116. $s(n) = (50 + 7n)^2 - 6(50 - 7n) + 17$ **; neither; It is quadratic and there is no common difference or multiplier.**

6-117.

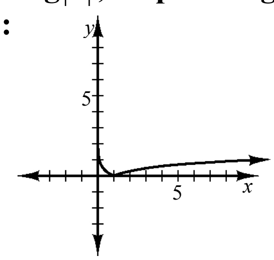


6-118. a and b: $g(f(x)) = |\log x|$ **or** $f(g(x)) = \log|x|$ **; respective graphs shown below**

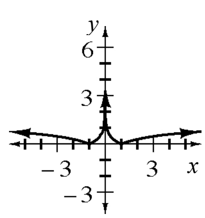
a:



b:



c: The log of an absolute value is very different from the absolute value of a log.
d: See graph below. Note that $x = 0$ **is an asymptote.**



6-119. $x \approx 1.68$

6-120. a: $b + a$, **b:** $3d + 2c^2$, **c:** $x - 1$, **d:** xy